



DEFENSE INFORMATION SYSTEMS AGENCY

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IN REPLY
REFER TO: Joint Interoperability Test Command (JTE)

MEMORANDUM FOR DISTRIBUTION

6 Jul 11

SUBJECT: Special Interoperability Test Certification of the Cisco Unity Connection Software Release 8.0(2) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital Interface

References: (a) DoD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008
(c) through (e), see Enclosure 1

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.

2. The Cisco Unity Connection Software Release 8.0(2) with PIMG Digital interface is hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Information System Network (DISN) as a Customer Premise Equipment (CPE) voicemail system. The SUT meets the critical interoperability requirements set forth in Reference (c) and testing was conducted using test procedures derived from Reference (d). The SUT was tested with the Avaya Communication Server (CS)1000M Single Group with the NT8D02GA digital line card and the Avaya S8710 with the TN2224CP digital line card. Additionally, JITC analysis determined the SUT is also certified for joint use with the following digital switching systems that are listed on the Unified Capabilities (UC) Approved Product List (AP): Avaya Meridian 1 (M1) Option 61C, Avaya M1 Option 81C, Avaya CS1000M Cabinet, Avaya CS1000M Chassis, and Avaya M1 Option 11C with the NT8D02GA digital line card, and the Avaya S8700, Avaya S8720, Avaya S8500, Avaya S8400, Avaya S8300, and Avaya G3CSI (ProLogix) with the TN2224CP digital line card. The SUT offers facsimile (fax) and e-mail capabilities; however these capabilities were not tested and are not covered under this certification. No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that could affect interoperability, but no later than three years from the date the DISA Field Security Operations (FSO) provided a positive Certification and Accreditation (CA) Recommendation.

3. This finding is based on interoperability testing, review of the vendor's Letters of Compliance (LoC), and FSO CA Recommendation. Interoperability testing was conducted at JITC's Global Information Grid Network Test Facility, Fort Huachuca, Arizona from 17 through 21 January

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2011. Review of the vendor's LoC was completed on 24 January 2011. The DISA CA provided a positive Recommendation on 16 June 2011 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (e). Enclosure 2 documents the test results and describes the tested network and system configurations.

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in Table 1. This interoperability test status is based on the SUT's ability to meet CPE voicemail system requirements specified in section 5 of Reference (c) verified through JITC testing and/or vendor submission of LoC.

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	UCR Paragraph
Avaya 2-Wire Digital Proprietary ¹ (TN2224CP)	No	Yes	FCC Part15/Part 68 (R)	Met	5.2.3.2
			DISR compliance as applicable (C)	Met	5.2.3.2
			ROUTINE precedence only in accordance with UCR, Section 5.2 (R)	Met	5.2.12.3.5
Avaya CS1000M 2-Wire Digital Proprietary ² (NT8D02GA)	No	Yes	FCC Part15/Part 68 (R)	Met	5.2.3.2
			DISR compliance as applicable (C)	Met	5.2.3.2
			ROUTINE precedence only in accordance with UCR, Section 5.2 (R)	Met	5.2.12.3.5
IP (100BaseT) (IEEE 802.3u)	No	Yes	Service Class Tagging (R)	Partially Met ³	5.2.12.8.2.9
			IEEE 802.3u (C)	Met	5.2.3.2
Security	Yes	Yes	Security (R)	See note 4.	3.2.3, 3.2.5
NOTES: 1 The SUT emulates an Avaya digital proprietary end-instrument (interfaces to digital card: TN2224CP) and is certified with all Avaya S8700, S8710, S8720, S8500, S8400, S8300, and G3CSI (ProLogix) switches listed on UC APL certified with their respective proprietary digital interfaces. 2 The SUT emulates an Avaya digital proprietary end-instrument (interfaces to digital card: NT8D02GA) and is certified with all Avaya Communications Server (CS)1000M Single Group, Meridian 1 (M1) Option 61C, M1 Option 81C, CS1000M Cabinet, Avaya CS1000M Chassis, Avaya M1 Option 11C switches listed on the Unified Capabilities (UC) APL certified with their respective digital interfaces. 3 The SUT met the Service Class Tagging requirements in accordance with UCR section 5.2.12.8.2.9 with the following exceptions: All Session Initiation Protocol (SIP) signaling packets from the Unity Connection Server were marked with a DSCP value of 24 decimal. The expected DSCP value is 40 Decimal. Additionally, the Unity Connection Server can not assign signaling packets a DSCP value of 0-63. The SUT PIMG Digital device tags all media packets with the correct DSCP value of 46 and can set any value 0-63 however the signaling packets from the PIMG Digital device were tagged at 0. DISA has adjudicated this discrepancy as having a minor operational impact. 4 Security is tested by DISA-led Information Assurance test teams and published in a separate report.					
LEGEND: 1000baseT 1000 Mbps (Baseband Operation, Twisted Pair) Ethernet 802.3-2005 Local Area Network/metropolitan Area Network Carrier Sense Multiple Access/Collision Detection Access Method A Appendix C Conditional DISR Department of Defense Information Technology Standards Registry DSCP Differentiated Services Code Point FCC Federal Communications Commission UCR Unified Capabilities Requirements IEEE Institute of Electrical and Electronics Engineers IP Internet Protocol JITC Joint Interoperability Test Command Mbps Megabits per second R Required SUT System Under Test					

5. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-


JITC Memo, JTE, Special Interoperability Test Certification of the Cisco Unity Connection Software Release 8.0(2) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital Interface

mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

6. The JITC point of contact is Mr. Edward Mellon, DSN 879-5159, commercial (520) 538-5159, FAX DSN 879-4347, or e-mail to edward.mellon@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The Unified Capabilities Connection Office tracking number is 1027703.

FOR THE COMMANDER:

2 Enclosures a/s


for BRADLEY A. CLARK
Chief
Battlespace Communications

Distribution (electronic mail):

Joint Staff J-6

Joint Interoperability Test Command, Liaison, TE3/JT1

Office of Chief of Naval Operations, CNO N6F2

Headquarters U.S. Air Force, Office of Warfighting Integration & CIO, AF/XCIN (A6N)

Department of the Army, Office of the Secretary of the Army, DA-OSA CIO/G-6 ASA (ALT), SAIS-IOQ

U.S. Marine Corps MARCORSYSCOM, SIAT, MJI Division I

DOT&E, Net-Centric Systems and Naval Warfare

U.S. Coast Guard, CG-64

Defense Intelligence Agency

National Security Agency, DT

Defense Information Systems Agency, TEMC

Office of Assistant Secretary of Defense (NII)/DOD CIO

U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68

Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

- (c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008 Change 1," 22 January 2010.
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
- (e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Cisco Unity Unified Messaging System Software Release 8.0(2) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital Interface (Tracking Number 1027701), 21 June 2011

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Cisco Unity Connection Software Release 8.0(2) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital interface is hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. Missile Defense Agency (MDA)

3. PROGRAM MANAGER. Mr. Stuart Strong, MDA/DXCA, 730 Irwin Avenue, Schriever Air Force Base, Colorado 80912, e-mail: stuart.strong@mda.mil.

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is for use with the switching systems within this certification over the tested interfaces using the Cisco Unity Connection software version 8.0(2). The SUT is a Voice Messaging System that offers Unified Communications capabilities through integration with Microsoft Outlook with Cisco ViewMail 8.0 on Windows XP and Vista in order to interface and provide Voice Message services to Certified Defense Switched Network (DSN) equipment. The SUT is capable of using two wire digital lines with the PIMG digital interface to provide these services. Survivability features included in the server platforms may include Redundant Array of Independent Disks (RAID) hard-drive arrays which support hot-swapping of drives, dual power supplies, and Network Interface Card (NIC) teaming depending on model. Microsoft Exchange may be installed on the same system as Unity Connection for Voicemail or Unity Connection can be integrated into an existing Microsoft Exchange infrastructure for Unified Messaging. The SUT utilizes a web-based interface to maintain the necessary information needed to provide messaging services to authorized mailbox owners as well as system maintenance. The information includes mailbox associations, system and messaging service settings, maintenance and diagnostics. The SUT offers facsimile (fax) and e-mail capabilities; however these capabilities were not tested and are not authorized nor approved for use within the DSN. Management of the SUT is through a site-provided, Secure Technical Implementation Guide (STIG)-compliant workstation, with Windows Experience (XP) Service Pack (SP) 3 installed.

6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) DSN architecture in Figure 2-1 depicts the relationship of the SUT to the DSN switches.

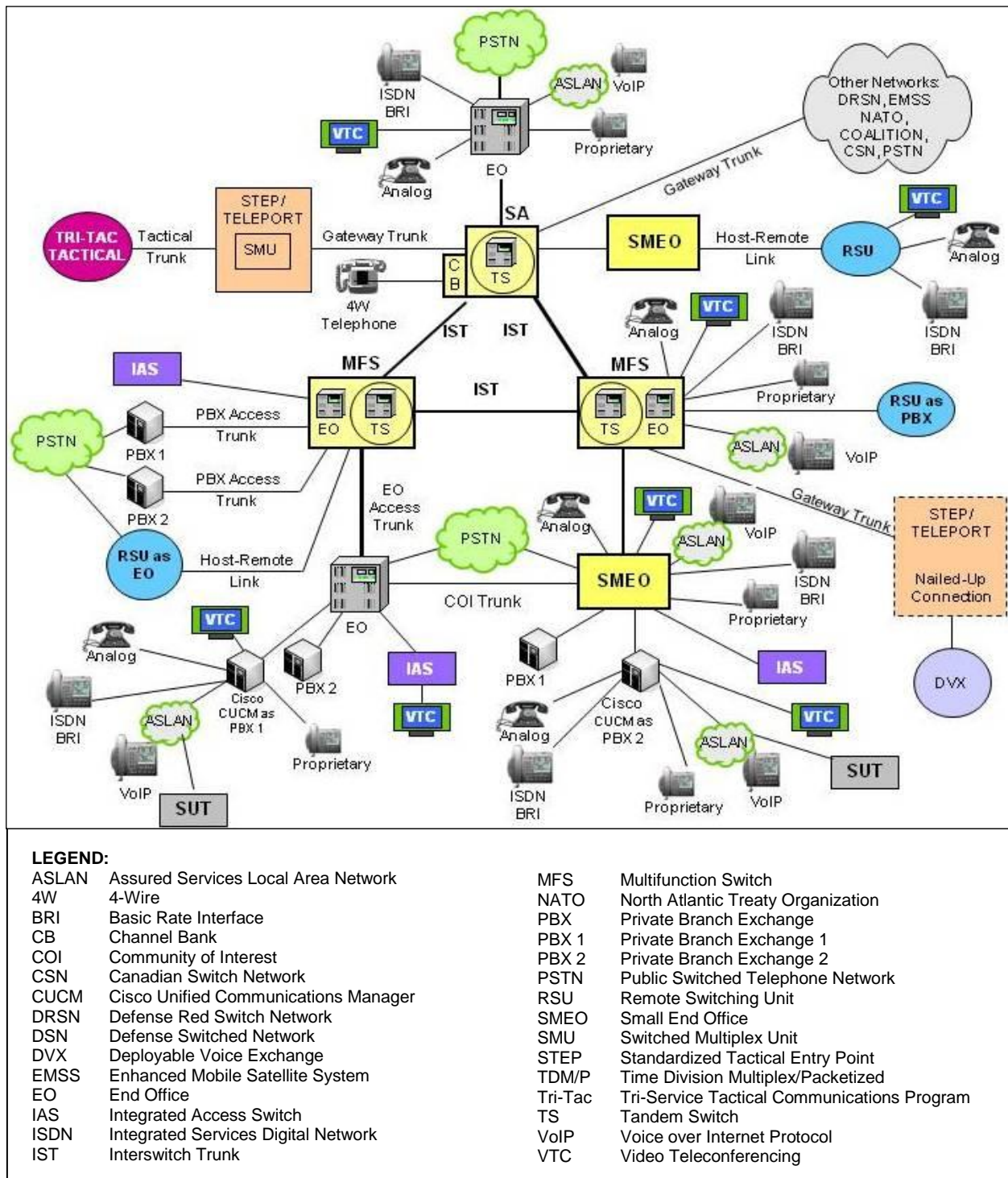


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in Table 2-1. These requirements are derived from the UCR Interface and Functional Requirements and were verified through JITC testing. The specific SUT applications certified on each interface are depicted in Table 2-1.

Table 2-1.SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	UCR Paragraph
Avaya 2-Wire Digital Proprietary ¹ (TN2224CP)	No	Yes	FCC Part15/Part 68 (R)	Met	5.2.3.2
			DISR compliance as applicable (C)	Met	5.2.3.2
			ROUTINE precedence only in accordance with UCR, Section 5.2 (R)	Met	5.2.12.3.5
Avaya CS1000M 2-Wire Digital Proprietary ² (NT8D02GA)	No	Yes	FCC Part15/Part 68 (R)	Met	5.2.3.2
			DISR compliance as applicable (C)	Met	5.2.3.2
			ROUTINE precedence only in accordance with UCR, Section 5.2 (R)	Met	5.2.12.3.5
IP (100BaseT) (IEEE 802.3u)	No	Yes	Service Class Tagging (R)	Partially Met ³	5.2.12.8.2.9
			IEEE 802.3u (C)	Met	5.2.3.2
Security	Yes	Yes	Security (R)	See note 4.	3.2.3, 3.2.5
NOTES: 1. The SUT emulates an Avaya digital proprietary end-instrument (interfaces to digital card: TN2224CP) and is certified with all Avaya S8700, S8710, S8720, S8500, S8400, S8300, and G3CSI (ProLogix) switches listed on UC APL certified with their respective proprietary digital interfaces. 2. The SUT emulates an Avaya digital proprietary end-instrument (interfaces to digital card: NT8D02GA) and is certified with all Avaya Communications Server (CS)1000M Single Group, Meridian 1 (M1) Option 61C, M1 Option 81C, CS1000M Cabinet, Avaya CS1000M Chassis, Avaya M1 Option 11C switches listed on the Unified Capabilities (UC) APL certified with their respective digital interfaces. 3. The SUT met the Service Class Tagging requirements in accordance with UCR section 5.2.12.8.2.9 with the following exceptions: All Session Initiation Protocol (SIP) signaling packets from the Unity Connection Server were marked with a DSCP value of 24 decimal. The expected DSCP value is 40 Decimal. Additionally, the Unity Connection Server can not assign signaling packets a DSCP value of 0-63. The SUT PIMG Digital device tags all media packets with the correct DSCP value of 46 and can set any value 0-63 however the signaling packets from the PIMG Digital device were tagged at 0. DISA has adjudicated this discrepancy as having a minor operational impact. 4. Security is tested by DISA-led Information Assurance test teams and published in a separate report.					
LEGEND: 1000baseT 1000 Mbps (Baseband Operation, Twisted Pair) Ethernet 802.3-2005 Local Area Network/metropolitan Area Network Carrier Sense Multiple Access/Collision Detection Access Method A Appendix C Conditional DISR Department of Defense Information Technology Standards Registry DSCP Differentiated Services Code Point FCC Federal Communications Commission UCR Unified Capabilities Requirements IEEE Institute of Electrical and Electronics Engineers IP Internet Protocol JITC Joint Interoperability Test Command Mbps Megabits per second R Required SUT System Under Test					

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in Figure 2-2.

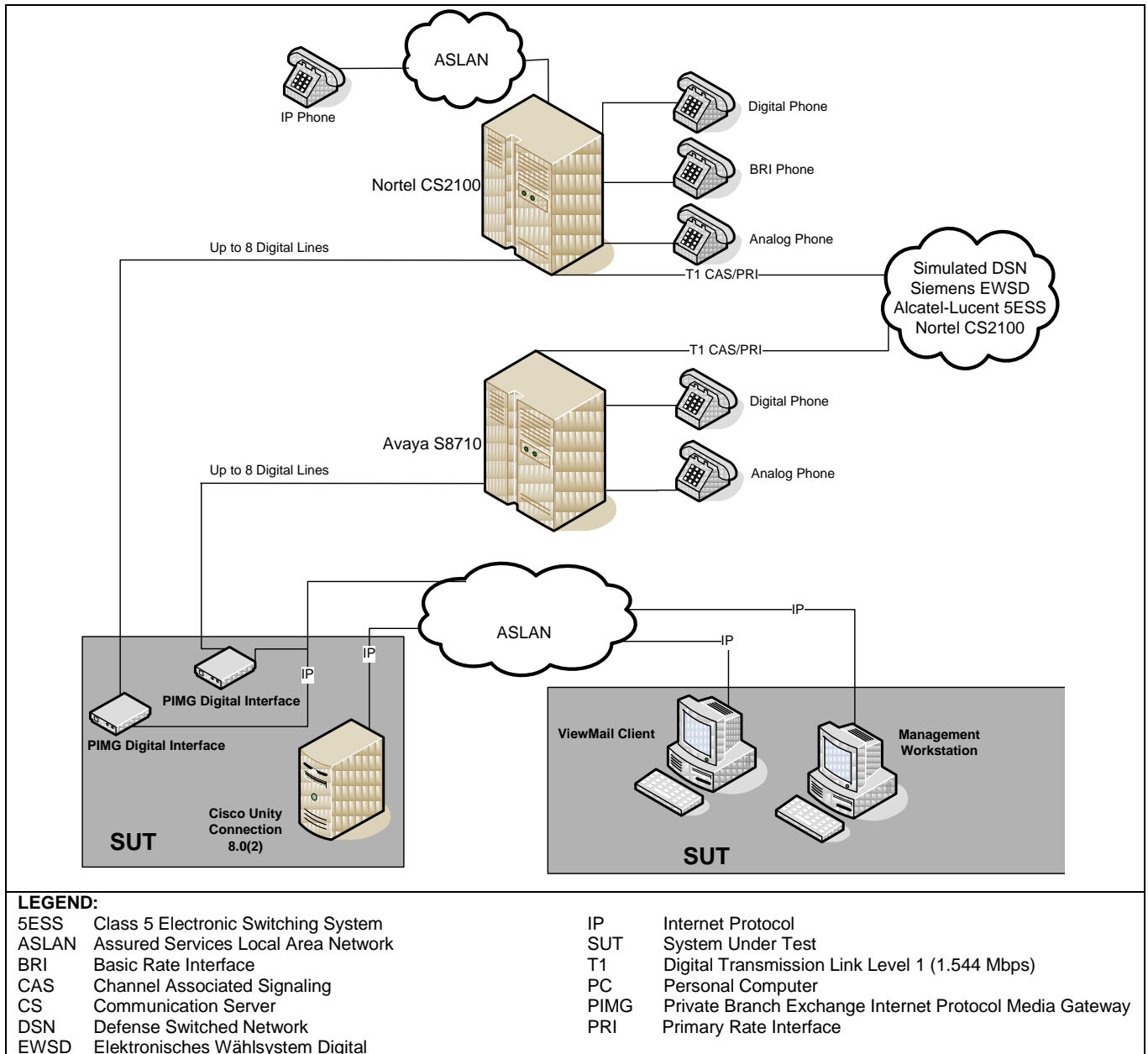


Figure 2-2. Cisco Unity 8.0(2) with PIMG Digital Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations, hardware and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in Table 2-2. The DSN switches listed in Table 2-2 only depict the tested configuration. Table 2-2 is not intended to identify the only switch software releases that are certified with the SUT. The SUT is certified specifically with the

following switching systems on the DSN APL that are certified with their respective digital interfaces: Avaya Communication Server (CS) 1000M Single Group, Avaya Meridian 1 (M1) Option 61C, Avaya M1 Option 81C, Avaya CS1000M Cabinet, Avaya CS1000M Chassis, Avaya M1 Option 11C, Avaya S8710, Avaya S8700, Avaya S8720, Avaya S8500, Avaya S8400, Avaya S8300, and Avaya G3CSI (ProLogix).

Table 2-2. Tested System Configurations

System Name		Software Release		
Avaya S8710		Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)		
Siemens EWSD		19d with Patch Set 46		
Avaya CS2100		Succession Enterprise (SE) 09.1		
Alcatel-Lucent 5ESS		5E16.2 Broadcast Warning Message (BWM) 09-0002		
Avaya CS1000M SG		5.0		
S U T	Cisco Unity Connection	Application	Hardware	Software/Firmware
		8.0(2)	Unified Computing System C210-M1	Cisco Unity Connection 8.0(2)
	PIMG Digital	Not Applicable	Private Branch Exchange Internet Protocol Media Gateway	6.0.SU7
Peripheral Components Telephones/ Digital Lines			Client Workstation	Microsoft Outlook with Cisco ViewMail 8.0 on Windows XP SP3, Windows Vista SP2
			Management Workstation	Windows XP Workstation SP3 and Windows Vista SP2
			Panasonic KX-TS15-W (Analog)	Not Applicable
			Panasonic KX-T2355 (Analog)	Not Applicable
			Siemens Optiset ISDN BRI	Not Applicable
			Avaya Digital Line Card TN2224CP ¹	HW08 FW015
			Avaya M5317T	5.0 1999
			Avaya Digital Line Card NT8D02GA ²	NA
NOTES: 1 The SUT emulates an Avaya digital proprietary end-instrument (interfaces to digital card: TN2224CP) and is certified with all Avaya S8700, S8710, S8720, S8500, S8400, S8300, and G3CSI (ProLogix) switches listed on UC APL certified with their respective proprietary digital interfaces. 2 The SUT emulates an Avaya digital proprietary end-instrument (interfaces to digital card: NT8D02GA) and is certified with all Avaya Communications Server (CS)1000M Single Group, Meridian 1 (M1) Option 61C, M1 Option 81C, CS1000M Cabinet, Avaya CS1000M Chassis, Avaya M1 Option 11C switches listed on the Unified Capabilities (UC) APL certified with their respective digital interfaces.				
LEGEND: 5ESS Class 5 Electronic Switching System APL Approved Products List BRI Basic Rate Interface CCM Cisco Call Manager CS Communication Server DSN Defense Switched Network EWSD Elektronisches Wählsystem Digital ISDN Integrated Services Digital Network MCS Media Convergence Server PIMG Private Branch Exchange Internet Protocol Media Gateway Rev Revision SG Single Group SP Service Pack SUT System Under Test				

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) Voice mail interaction with Multi-Level Precedence and Preemption (MLPP). The UCR, section 5 states that CPE must meet MLPP requirements. The SUT was tested in accordance with the UCR, section 5.2, which states that precedence levels above ROUTINE shall not be forwarded to voice mail. The SUT was tested to insure that it properly interacted with MLPP as required in the UCR, section 5.2. Intra-switch and inter-switch calls were placed over the network test configuration to subscribers configured on the Cisco Unity Connection and assigned voice mail at different precedence levels with the following results:

(a) All ROUTINE calls placed to a voice mail subscriber that was busy or did not answer, were properly routed to voice mail as required by UCR, section 5.

(b) All calls above ROUTINE placed to a voice mail subscriber that was busy or did not answer were not routed to voice mail, but instead were diverted to an alternate directory number if not answered before the precedence call diversion timer expired, as required by UCR, section 5.

(2) Differentiated Services Code Point (DSCP). UCR 2008, Change 2 paragraph 5.3.3.3.2, states that the product shall support the plain text DSCP plan, as shown in Table 5.3.3-1, DSCP Assignments, and the DSCP assignment shall be software configurable for the full range (0-63) to support Deployable deployments that may use a different DSCP plan.

(a) DSCP tagging. Captures were taken between the SUT PIMG-Digital and the Unity Connection. Voice media was sent as International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) G.711 packets to and from the PIMG-Digital. All ITU-T G.711 packets were 20 milliseconds in size and were correctly tagged with a DSCP priority of hexadecimal 2E (decimal value 46). Voice signaling packets between the SUT PIMG-Digital and Unity Connection server utilized Session Initiation Protocol (SIP) was also captured. All SIP signaling packets from the PIMG-Digital were incorrectly tagged with a DSCP value of 0. The expected signaling DSCP value is 40 decimal. The signaling DSCP value from the Unity Connection server was also incorrectly tagged at 24 instead of 40 decimal. Additionally, the PIMG-Digital and the Unity Connection server interfaces cannot assign a signaling DSCP value of 0-63. DISA has adjudicated this discrepancy as having a minor operational impact. The SUT provides the ability to convert a voicemail message recorded by a user in the SUT to Internet Message Access Protocol (IMAP) IP packets transmitted to a PC client in the form of WAV file in an email. Cisco ViewMail for Outlook (VMO) add-in client software allows the PC user to send, listen to, and manage messages directly from their Outlook

Inbox. This functionality was tested and the IMAP packets transmitted by the SUT to the PC client were correctly tagged DSCP value of 0. The Management Workstation has the ability to tag any value 0-63 and correctly tag DSCP at 16 for operational network management traffic.

(b) Test Summary. The SUT meets the critical interoperability requirements for a Customer Premise Equipment voice mail system in accordance with reference (c). The SUT was tested with the Avaya Communication Server (CS)1000M Single Group with the NT8D02GA digital line card and the Avaya S8710 with the TN2224CP digital line card. Additionally, JITC analysis determined the SUT is also certified for joint use with the following digital switching systems that are listed on the Unified Capabilities (UC) Approved Product List (AP): Avaya Meridian 1 (M1) Option 61C, Avaya M1 Option 81C, Avaya CS1000M Cabinet, Avaya CS1000M Chassis, and Avaya M1 Option 11C with the NT8D02GA digital line card, and the Avaya S8700, Avaya S8720, Avaya S8500, Avaya S8400, Avaya S8300, and Avaya G3CSI (ProLogix) with the TN2224CP digital line card. The SUT offers facsimile (fax) and e-mail capabilities; however these capabilities were not tested and are not covered under this certification. No other configurations, features, or functions, except those cited within this report, are certified by the JITC.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssj>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.